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ABSTRACT

This report, one of a series of eight, provides findings from a study of the Ohio pupil transportation system, a locally administered system partly regulated and financially supported by the State. After reviewing current transportation facilities for both regular and special education students, the study assesses various alternatives. Recommendations include reorganization of the present system into larger operating units, State ownership and maintenance of all school buses, centralized purchasing, expanded bus driver training programs, computerized routing service, and frequent bus inspections by trained personnel. The report was funded under ESEA Title III. Related documents are ED 028 279, ED 032 737, ED 035 967, and EA 002 870. (LR)

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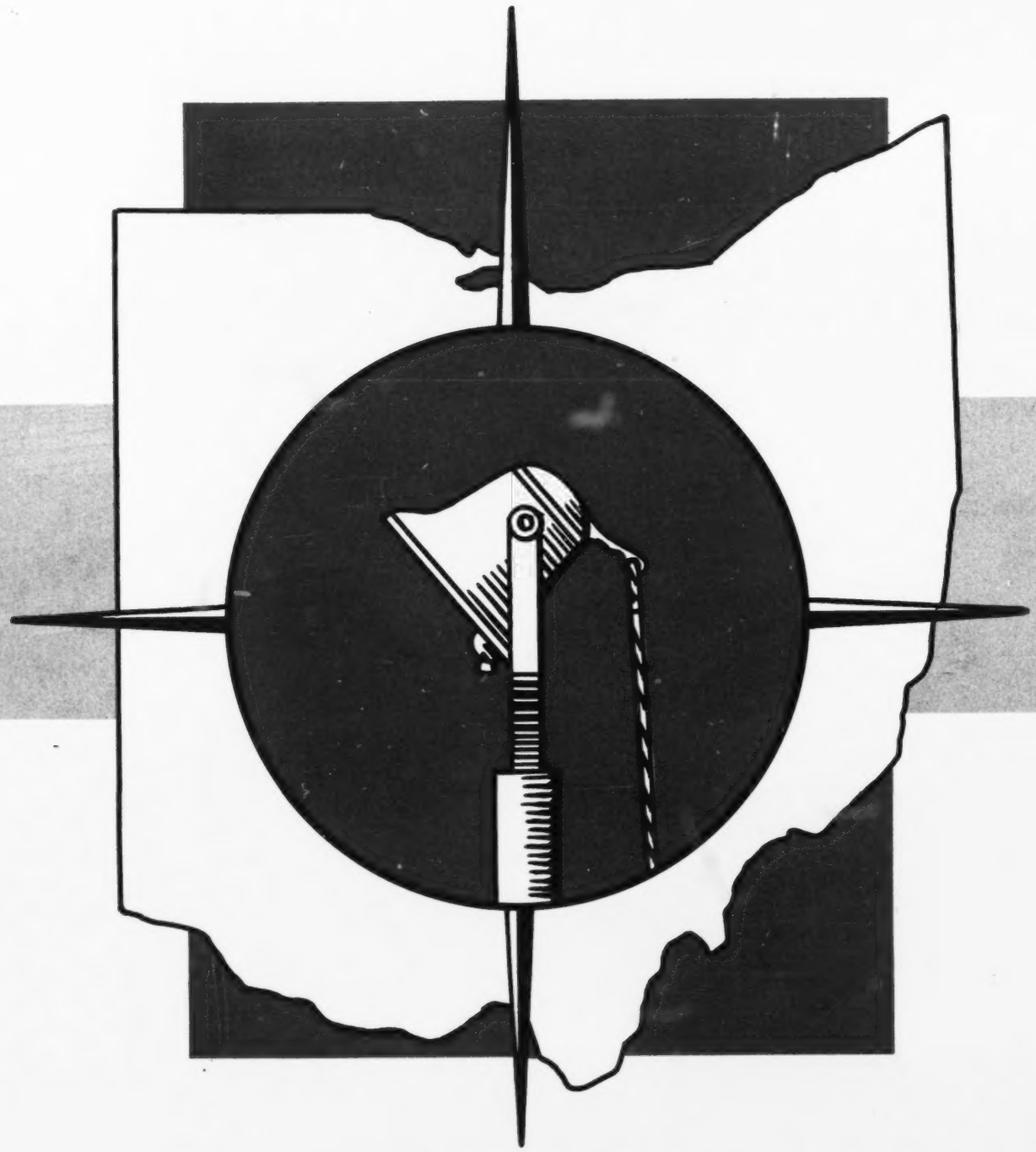
PUPIL TRANSPORTATION



PREPARED FOR THE

OHIO DEPARTMENT OF EDUCATION

BY

BATTELLE MEMORIAL INSTITUTE
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CONDENSED TASK REPORT

on

PUPIL TRANSPORTATION FOR THE OHIO SCHOOL SYSTEM

to

OHIO DEPARTMENT OF EDUCATION

November, 1968

by

R. H. Byers and W. P. Virgin

U.S. DEPARTMENT OF HEALTH, EDUCATION
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FOREWORD

This report is the result of editing and reducing one of a series of Task Reports prepared by the staff of Battelle Memorial Institute, Columbus Laboratories, for the Ohio Department of Education under a contract research project entitled **PLANNING TO MEET EDUCATIONAL NEEDS IN OHIO SCHOOLS.** Funds for the project were made available under a Title III, ESEA grant from the U.S. Office of Education to the Ohio Department of Education.

This condensed version of a Battelle Task Report was prepared to present the essentials of Battelle's findings as briefly as possible without loss of content or continuity in order to facilitate dissemination of the research findings to a wider audience.

Battelle has assessed educational needs in vocational education and technical training, school facilities, paraprofessionals and supportive assistants, data processing, educational technology, library services, and pupil transportation, each of these being the subject of a research Task.

Eight reports were prepared by Battelle as a result of these studies: seven Task Reports and one Summary Report. The Task Reports represent research studies aimed at the seven subjects mentioned above. The recommendations and conclusions stated in the Task Reports do not reflect full consideration of the educational system as a whole. The Summary Report considers the Task Reports collectively and seeks to relate the results of the Task studies to the educational system as a whole.

The reader is thereby offered two views, one of a specialized nature through a Task Report and one of an integrative nature through the Summary Report. The two views will have much in common, but will occasionally reflect differences arising out of the different context in which the studies were viewed. Accordingly, the reader may wish to study both the Summary Report and the related Task Report on a given subject.

This report is a Condensed Task Report. It carries the essential impact of the Task Report from which it was taken.

Dissemination of the material contained herein is the responsibility of the Ohio Department of Education. Requests for copies with designation of the report(s) desired, may be directed to Dr. Russell A. Working, Division of Research, Planning and Development, 71 East State Street, Room 205, Columbus, Ohio 43215.

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PUPIL TRANSPORTATION FOR THE OHIO SCHOOL SYSTEM

INTRODUCTION

The school bus fleet in the State of Ohio totals approximately 13,000 buses. These buses are used to transport well over a million students daily at a yearly operating cost in excess of $40 million. Under present procedures the pupil transportation system operates as approximately 648 individual systems administered by local school districts tied together by the Pupil Transportation Section of the Ohio Department of Education. The Pupil Transportation Section maintains 30 transportation coordinators throughout the State in addition to its Columbus-based staff. The function of the Pupil Transportation Section includes administering funds for reimbursing local school districts for purchase of buses and for transportation operating costs (if a district is eligible for such financial aid), maintaining specifications, establishing requirements for bus inspections, conducting or assisting in the presentation of driver training courses, conducting transportation workshops, investigating and analyzing school bus accidents, assisting in routing and scheduling studies, fulfilling the legal responsibilities of the State Department of Education with regard to pupil transportation and providing assistance to the local school districts in providing as safe and economical pupil transportation operation as possible.

BATTELLE'S FUNCTION

The purpose of Battelle's efforts was to (1) examine the pupil transportation system as it exists today, (2) review past evaluations of the transportation system such as the Little Hoover Commission Report* and the Practitioner Panel Report, (3) obtain opinions from individuals involved in pupil transportation, and (4) formulate and evaluate various alternatives to provide the Department of Education with information to assist them in planning for improving the efficiency, performance, and safety of the pupil transportation system in the State of Ohio.

GOALS OF THE PUPIL-TRANSPORTATION SYSTEM

The goal of the pupil-transportation system is to provide a transportation service which conforms to State laws and regulations and local service requirements in a manner which insures the maximum safety for school children as economically as possible. The State Legislature establishes pupil transportation goals and operating constraints by legislation which establishes the responsibilities of the State Department of Education and the separate school districts. Furthermore, the Legislature imposes a financial constraint upon the system through appropriation. The Transportation Section of the State Department of Education, operating within the authority established by legislation, establishes goals and operating constraints for the individual school districts through State

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*Council for Reorganization of Ohio State Government, Public School Survey and Recommendations, Columbus, Ohio (November, 1967) 121 pp.

regulations and reimbursement policies. Local schools may establish goals and policies which go beyond those established by the State Department of Education and the Legislature in order to meet the service and safety requirements of the individual district.

THE ELEMENTS OF THE PUPIL-TRANSPORTATION SYSTEM

Before proceeding with the formulation of alternative approaches to improving the pupil transportation system, it is necessary to have knowledge of the existing system. Since the goals of pupil transportation fall into three general categories: service, safety, and costs, it is convenient to discuss the existing system and its shortcomings in terms of this breakdown.

Service

Policy

Under current State policy, all school districts receive financial aid for pupil transportation under one of two methods. The method used for reimbursement of a specific school district depends on the tax base or tax valuation per pupil. The State establishes the valuation level per pupil below which schools are categorized as additional aid districts. School districts having a valuation per pupil greater than the cutoff level receive reimbursement for transportation through the foundation formula. Schools having a valuation per pupil below the established level receive reimbursement for transportation on the basis of a specific transportation formula, provided the total amount of money received under this formula is greater than that received under the state school foundation formula. In general, the specific transportation formula provides the highest level of reimbursement.

Under the additional aid formula the State pays a certain percentage of the purchase price of each new school bus. The percentage that the State pays depends on the valuation base per pupil of an individual school district. At the present time the reimbursement percentage varies from 27 percent to 82 percent. Approximately 85 percent of the school districts in Ohio have a tax valuation per pupil lower than the cutoff point for additional aid and therefore qualify for this aid. The percentage of reimbursement by the State for the purchase of new buses applies to the 1966 State bid price for buses and not the actual price paid by the school district. In 1966 the average aid for the additional aid districts for the purchase of school buses was 56 percent of the State bid price. Under the Fair Bus Bill the State pays 100 percent of the State bid price for buses required to transport nonpublic students regardless of whether the district qualifies for the additional transportation aid.

Districts qualifying for additional transportation aid also receive reimbursement for operating expenses. There are various plans for reimbursement depending on the method the local district uses in providing the transportation. The most common situation is board-owned-and-operated buses. This type of operation is termed a C plan. Under this plan a school district qualifying for additional aid receives $16 per pupil transported per year. In addition, the school district receives a payment ranging from

$22 to $28 per year for each mile that a bus travels in an average school day, depending upon the classification of roads in the school district. There are additional plans dealing with such things as contractor bus services, contract with another school district, and transportation provided by parents. If the actual transportation cost is less than the formula cost, reimbursement is based on the actual cost.

Transportation of handicapped children is handled by the Special Education Division of the Department of Education. The Transportation Section is involved in the transportation of handicapped children only to the extent of approving the purchases of buses. It is estimated that more than one-half of the current State expenditure for handicapped services (approximately $2.1 million total) is spent on transportation. Local school districts are responsible for providing the transportation even if the school to which a child is being transported is located in another school district. The school district providing the transportation is reimbursed the actual cost of transportation up to a maximum value of $2 per day per child plus 1/2 of the excess cost over $2 per day. Decisions relating to the procurement of insurance and the level of insurance are left to the local school districts.

Transportation of handicapped children, like other problems in the service of these children, is complicated because the area served by a school for handicapped children crosses school district boundaries and there is not a single authority which coordinates the assignment of the handicapped child and the transportation of that child. There is difficulty in obtaining transportation for some of these children. Because of their special needs, greater consideration and effort should be expended to select vehicles which are most suitable for these needs and to select and train drivers for these vehicles.

Providing the Service

Routing and Scheduling. In the present system the local district has control over the routing and scheduling of buses. The Pupil Transportation Section, at the request of a local district, makes a routing and scheduling service available through the transportation coordinators.

At the present time routing studies are a completely manual operation. One of the goals of project Tri-Tran* is to develop a computer scheduling program which would be useful throughout the State. When completed, this program should permit more extensive routing surveys throughout the State and, based on past savings realized when results of routing surveys were implemented, the use of such a computer program should result in considerable transportation cost savings.

Driver Management. The State establishes minimal driver qualification requirements. The primary requirement is a chauffeur's license endorsed for operating a school bus. In addition, the driver must have a medical and eye examination and pass a driver's test in a school bus. In order to qualify, a person has to be of good moral character and be at least 21 years of age. The local school district is responsible for selection and procurement of drivers.

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*Tri-Tran is a Title III demonstration transportation project being conducted in Hamilton County, Ohio.

Safety

Drivers

Drivers are a very significant element in the overall pupil transportation safety picture. In the 1967-68 school year there were approximately 1500 accidents in Ohio involving school buses. Of this number, the driver was indicated to be at fault in more than 900 accidents. While a great number of these reported accidents were minor in nature, this is not an impressive driver-safety record. The reason for driver-caused accidents is not obvious. At the present time it is estimated that approximately 4,000 drivers (24 percent), out of the total of 15 to 18 thousand currently driving full- or part-time in the State, have received formal school bus driver training.

The Transportation Section of the State Department of Education has developed a driver training manual and through its coordinators assists local districts in conducting bus driver training courses. Certain individuals at the local level are also qualified to conduct bus driver training courses. At the present time, there are approximately 43 such certified instructors in the local school districts.

During fiscal year 1967-68, a total of 71 school bus driver training classes were held. Of these, 34 were taught by transportation coordinators and 37 by certified instructors. A total of 1,011 drivers were trained during this period.

The critical needs with regard to school bus drivers appear to be (1) develop an accelerated effort to train all bus drivers, (2) develop an effective means for evaluating driver performance (most likely through improved accident data collection and analysis) to provide feedback necessary to improve the driver-training program, and (3) develop a retraining program or refresher course for experienced drivers.

Vehicles

The Transportation Section of the State Department of Education is responsible for developing school bus standards. The local school districts use these standards to write specifications for purchasing buses. Under the present system of individual school district purchases, there is not as much incentive for manufacturers to meet specifications as there would be if all school buses were purchased under a single bid.

A major problem in establishing specifications is the development of the base data required to formulate the specifications. At the present time, the primary basis for standards is experience in the Transportation Section supported by information made available to it by people involved in transportation at the local level. In addition, there is an exchange of information with the manufacturers and other transportation-oriented individuals in other states. Some information is derived from accident reports and from the annual school bus inspections conducted by the Highway Patrol.

A statewide inspection of all school buses is conducted annually each summer prior to the start of the school year. This inspection is conducted by the State Highway Patrol with technical assistance from the Transportation Section. Subsequent inspections during the school year are left to the discretion of the local school districts. Such a procedure, which relies on the judgment of the individual drivers and bus mechanics, is expected to

result in a wide variation in the condition of buses operating throughout the State. The exact impact of such a policy on safety and on maintenance cost is not known, but a more dependable and economical service certainly could be expected with more regular inspections and corresponding maintenance operations.

Maintenance is closely related to inspection. At the present time, maintenance practices vary. Some local districts have their own maintenance garages and have well-qualified mechanics. Other local districts depend on local garages and service stations to provide the necessary maintenance. As the Little Hoover Commission reported, the operators of vehicle fleets, taxis, and trucks have found that vehicle life is prolonged by regular maintenance. It is reasonable to expect that the same would apply to school buses.

Accidents

All reported accidents involving a school bus are investigated by the State Highway Patrol. Accident reports are filed with the Transportation Section. During the 1967-68 school year, there were a total of 1,535 accidents involving a school bus. In these accidents, a total of 443 persons were injured and 7 persons were killed. None of the fatalities occurred inside the school bus. Examination of the accident statistics for the 1967-68 school year reveals that the bus driver was said to be at fault in approximately 61 percent of all the accidents.

There is a need for a more extensive accident investigation to provide information on the specific causes of accidents and to identify factors contributing to the frequency and severity of accidents. This information should prove very beneficial in improving procedures for the selection and training of drivers, in establishing school bus standards and in developing meaningful maintenance programs. Accident investigations should include those accidents involving school children walking to and from school. This type of investigation along with investigation of accidents involving buses, would provide information required to evaluate transportation operating policies. For example, many districts provide transportation to children well within the 1-mile limit for reimbursement because of what they feel are safety considerations. Accident investigations will provide a better base for making such judgments.

The common practice at the present time is to pick up and discharge a pupil at his place of residence. It has been suggested by some that it might be possible to reduce costs and route time by establishing student collection points. This arrangement has worked out quite satisfactorily in some instances, but in others the gathering of fairly large numbers of students at one location in a residential area presents discipline and safety problems and has resulted in complaints from the local residents. Local school administrators are in the best position to evaluate the merits and specific details of collection points. Accident studies might aid in these decisions.

Cost Considerations

Bus Purchase

Under present law, individual school districts are responsible for the purchase of buses. In 1966 a State purchase plan was implemented. Under this plan local school

districts could purchase buses under the State bid or they could continue to purchase buses locally. In addition, they could choose to buy the chassis under the State plan and the body locally, or vice versa. In the 1966-67 school year, 1,235 new buses were purchased. Of these, 846 were bought through the State plan; 287, locally, and 102, on a split basis*. The legality of the centralized purchase plan has been challenged in the courts and has to this time been blocked. However, the 1966 State bid prices are still used as a basis for calculation of reimbursement to the local school districts for the purchase of buses. The local school district pays its share of the State bid price plus any additional amount over this price.

Eligibility for reimbursement for bus purchase and for operating costs, along with the reimbursement formulas, are discussed in an earlier section of this report. The average State reimbursement for all buses purchased is approximately 56 percent of the State bid price at the present time.

Purchase of Supplies

Under the present system, individual school districts are responsible for purchasing all school bus supplies. The policy used by individual school districts may vary from taking bids for certain items to purchasing at retail prices. In general, quantities involved in local purchases are rather small, making it difficult to take advantage of any quantity prices. Collectively, it is estimated by the Little Hoover Report that approximately $9.5 million was spent in the 1966-67 school year for supplies. The State reimburses local school districts for operating expenses either under the school foundation formula or through the special transportation formula for schools classified as additional aid districts. The reimbursement formula for transportation aid is based on the statewide average. Reimbursement may or may not cover all of the expenses of the specific school district. The local district must pay for all expenses over and above the reimbursed amount. The average State reimbursement for operating costs is currently about 85 percent of the total.

Maintenance and Operations

Maintenance policies and practices are established at the local level at the present time. The State does not directly establish maintenance requirements for school buses. The State exercises some control over maintenance through the process of having to approve school bus purchases involving State reimbursement. If a local district fails to maintain a bus properly and it wears out sooner than it should, the State may not approve replacement. In this fashion, the local districts are encouraged to take good care of their buses. Also, State reimbursement for operating costs which include maintenance is based on State averages and thus it is to a school district's advantage to develop a maintenance program which results in the lowest overall cost. A policy of repairing only upon the occurrence of a failure is probably not the cheapest policy in the long run.

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*The Little Hoover Report estimated that approximately $800,000 was saved by purchasing buses during this school year under the State purchase plan. It was also estimated that an additional $270,000 could have been saved if all buses had been purchased under this plan.

Maintenance

Bus maintenance is an important operation of the pupil transportation system, affecting both the costs of operation and safety.

The small size of many local school district transportation operations makes it extremely difficult to formulate an effective maintenance program at a reasonable cost. In general, the larger the system is, the more effective the maintenance program can be. Of course, there is an upper limit on the number of buses that can be handled efficiently in a single maintenance facility. This would appear to be on the order of 200 buses or more. Maintaining a large number of buses in a single facility is desirable for several reasons.

(1) Such a facility permits the employment of full-time mechanics or specialists in maintaining school buses.

(2) The large number of buses permits the purchase of supplies in larger quantities, thereby realizing a cost savings.

(3) Experience with a large number of buses provides a better data base for the establishment of a preventive-maintenance program.

(4) Larger operational units permit a reduction in the number of spare buses required.

Summary of the Present Ohio School Transportation System

The present pupil transportation system may be described as basically a locally controlled system operating under constraints of State regulation and heavily supported by State funds. There are approximately 648 local transportation units operating some 13,000 buses at an annual expenditure of about $40 million. More than a million pupils ride school buses each school day. The primary constraints imposed by State regulation relate to the conditions under which the local districts are reimbursed for purchase of new buses and for operating expenses. Constraints also exist with regard to driver qualifications and training and, to a very minor extent, bus maintenance through a once-a-year inspection of the buses. Local districts have primary control over bus routing and scheduling. Local districts can avail themselves of routing and scheduling service provided by the State if they so desire. Local districts control bus maintenance, selection of drivers and driver-training programs. Local districts also determine the need for transporting children. This need may be based on safety reasons or extracurricular transportation in addition to the normal transportation. Such situations may not be covered by State reimbursement regulations.

The major defects of the present system are in the localized purchasing of buses and the operating efficiency. Because the present structure consists of 648 essentially independent transportation systems, the expense of operating the smaller systems is much greater than would be required for a single system or at least a fewer number of larger systems. The Little Hoover Report indicated that savings on the order of 25 percent of current operating expenses could be realized by consolidating the smaller systems

into a single transportation system. In addition to reducing the expense of operating the transportation system, it also appears that improved service and improved safety could be realized in a larger operational unit. Better maintenance procedures could be instituted, better schedules could be developed, better driver-training programs could be carried out, and better overall management of the transportation function could be accomplished with the larger units. Advantages of the present system configuration should be retained at the local level regardless of any changes which might be made in the overall system. One of the advantages of the existing system is that it recognizes that transportation is a supportive or service function and should be geared to serve the educational program. While it may be possible to adjust school schedules and activities to assist in improving transportation performance, transportation must remain essentially a service and not impose serious constraints on the educational process. Disciplinary functions can best be handled at the local level regardless of any changes in the overall transportation system.

TRANSPORTATION FOR SPECIAL EDUCATION

General Requirements

The Division of Special Education of the State Department of Education provides educational opportunities to children who are unable to attend regular school classes or who are unable to benefit from attendance in the classes. These children include the physically, mentally, and emotionally handicapped. Supervision of the educational programs for the handicapped has been placed in a separate division of the Department of Education because the incapacities of the children require special programs and services. Among the special services required are those of transportation.

Transportation may be approved for physically handicapped children attending a special class program, a regular class in public or parochial school, or for emotionally handicapped children when attending a special class program.

The transportation portion of the special education services is large. During the school year 1966-67, 4,865 pupils were transported at a cost of $1.4 million. This is more than half of the amount spent for all services. Such expenditures for transportation have increased by 61 percent over a 5-year period.

In addition to the children who are under the administrative jurisdiction of the Division of Special Education, there are many being educated in county and municipal programs.

The transportation of handicapped children imposes different requirements than the transportation of regular pupils. The children are distributed over as large an area as other children in the school district, yet the numbers are far smaller. Thus, smaller vehicles are needed. Many of the children require special handling because of physical handicaps or special treatment and supervision because of mental or emotional handicaps.

Pupil transportation for special education is largely carried out by contractors who use a variety of vehicle types: vans, taxicabs, and station wagons. The vehicles are

required to meet certain safety standards, but the general design for the vehicles is uncontrolled. Likewise, the drivers are not required to have any specialized training for coping with the special needs of the children.

Recommendations

The transportation functions of the Special Education Division have been examined briefly and three areas are suggested in which improvements might be made.

(1) Cost Reduction. Higher per-pupil costs are to be expected for transportation of special pupils, as against the costs for regular pupils, because of the dispersal of the pupils and the need for smaller vehicles. However, the large fraction of the budget which is taken for transportation suggests that a close look at the operation is warranted.

(2) Driver Training. The training which drivers should have for handling these types of children should be defined and a mandatory training program instituted.

(3) Improved Vehicle Safety. There have been suggestions that some vehicles which are now used for special education transportation are not as safe as they should be, particularly under a side impact. Greater effort should be made to determine the requirements for transporting special-education pupils, for setting construction standards, and for enforcing them.

IMPROVING THE PUPIL-TRANSPORTATION SYSTEM

Fundamental Causes of the Problems

The pupil-transportation system in Ohio has more than 648 operating units, each being very largely independent of the others. The statutes which apply to pupil transportation, and the policies of the State Department of Education, permit individual Boards of Education wide latitude in the operation of their transportation system. The results are, "...duplication of effort and facilities, inefficiency, and excessive costs", to quote the report of the Little Hoover Commission.

There are very few controls on pupil transportation: buses must meet State minimum standards when purchased and must pass an annual inspection, drivers must meet certain requirements but are not required to have any particular experience or training, all accidents must be reported but there is some suspicion that they are not, and the service must not be less than a certain minimum. Except for these few limitations, each school district is free to determine its own policies. The consequence is a set of widely disparate transportation systems differing in the service provided and in the efficiency of operations.

Fundamental problems in the pupil-transportation system are a natural result of the fragmentation of the system.

General Problem Solution

Larger Transportation Units

The general solution to the problems of pupil transportation lies in the direction of larger operating administrative units under strengthened direction and control of the State. Restructuring of the system can make it possible to achieve economies which are not now possible and can provide better information sources for further improvement of the system. The Little Hoover Commission proposed the creation of a State pupil transportation authority by which the State would assume nearly complete responsibility for pupil transportation. The Practitioner Panel which was formed to evaluate and comment on the Commission report proposed a somewhat different structure, one in which the job of transportation would be carried out by a number of transportation operational (administrative) units, controlled by an elected board.

The reports of the two groups will be discussed at a later point in this report, and other alternatives will be presented. There is, however, a general agreement that a new organization is needed and that, whatever its form, it must be based on larger operating units.

The statewide pupil-transportation system is complex, exceeding many municipal transit systems in both number of vehicles and number of passengers. It is a costly system. Annual expenditures have been estimated to exceed sixty million dollars within 10 years. Efficient operation of the system requires the very best talent available. The Little Hoover Commission Report states, "Throughout the entire pupil transportation area, a high degree of dedication, ingenuity, ability, and determination exists". There is no question but what this statement describes the men who daily must contend with the problems, within the limitations of the present inadequate system. Too often, however, the supervision of transportation services is assigned as an additional duty to an administrator who must also fulfill some other primary function. Even where a supervisor is assigned full time to pupil transportation, the assignment may go to one whose principal training lies in education instead of in the field of transportation management. Larger operating units will require direction by people who are highly qualified in transportation if the greatest benefits are to be achieved.

System Improvements

The Little Hoover Commission and the Practitioner Panel have made a number of recommendations for improving elements of the pupil transportation system and for initiating major changes in the organization.

Transportation Policy

Both the Commission and the Panel urged a review and modification of the present law and policy regarding the service offered and the reimbursement policy. The Panel

felt that a redefinition of the mandatory transportation law is necessary and that factors other than mileage should be considered when determining whether transportation is necessary. Other factors might include: (1) hazardous walking areas, (2) the length of the school day, and (3) the curriculum opportunity as it relates to school consolidations. The Panel further recommended a uniform transportation policy and that the law and policy be correlated. The Panel's recommendations can be summarized as follows:

(1) Define the necessity for transportation, taking factors other than mileage into consideration.

(2) Establish a uniform policy for the State.

(3) Provide transportation service on the basis of the present reimbursement policy.

(4) Provide funds for the entire cost of transportation at the State level, except for extracurricular transportation and extra service demanded by local conditions.

Battelle offers the following commentary on the formation of a new transportation policy. In general, when the law requires transportation for elementary pupils living more than 2 miles from their school, the policy is to make reimbursement for transportation of all pupils who live more than 1 mile from their school. If the law which defines the necessity for transportation is changed to conform with the reimbursement policy, then many districts which are not now busing pupils in the 1 to 2-mile range would be required to do so. The effect would be to send the total state transportation costs soaring. The increase in costs might be held down if the necessity for transportation were not strictly on a mileage basis but included consideration of other factors such as hazardous conditions. It is likely that many of the pupils in the 1 to 2-mile range are in city districts with safe walking areas and transportation would not be deemed necessary. On the other hand, to make policy and law agree by changing the policy and reimbursing only for pupils beyond a 2-mile limit would force many districts which are now busing in the 1 to 2-mile range to discontinue, raising a storm of protest across the State. Having set a permissive policy which is more lenient than the law, it is now going to be difficult to go either way.

Centralized Purchasing of Buses and Supplies

The dollar savings to the education system of a State bid-purchase plan have been well demonstrated. According to the Little Hoover Commission report, nearly $800,000 was saved in the one year that the plan was in effect (1966-67). Since that time the program has been blocked by legal action. Unobstructed authority for the State to purchase buses is the key to major cost savings and every effort should be exerted to resolve the litigation in favor of the plan.

Centralized purchasing of supplies (gasoline, oil, tires, antifreeze, parts) should also be made in large-order quantities. A uniform price throughout the State may not necessarily be the most economical plan. Regional variations in the price of gasoline, for example, may make it more desirable to receive bids and purchase on a regional basis. Assuming that pupil transportation is eventually organized into larger

administration units, the best plan may prove to be to have each unit receive bids and make purchases for its own territory. The expected savings from large-order buying may be offset somewhat by the need to provide warehousing and distribution within the pupil transportation system. The magnitude of the storage and distribution problem, and its solution, can best be examined after a decision is made as to how the transportation system is to be organized. The investigation will require a detailed study of the quantities of the items used, delivery schedules, and the locations of the maintenance and servicing garages.

Vehicle Maintenance and Replacement

The criteria for bus replacement are now almost entirely based on the age of the bus, 10 years being the standard value. With so many operating units keeping records of varying detail and in varying form, it is nearly impossible to do more than to set an arbitrary age for replacement. A more uniform record system is needed and, if the transportation system is reorganized, maintenance garages should be required to use the record system.

Uniform and detailed records will be a valuable source of information which can be analyzed to:

(1) Form a more realistic bus-replacement policy
(2) Evaluate maintenance procedures and set guidelines
(3) Evaluate bus components.

The design of a comprehensive record system has been completed in Project Tri-Tran and experience in its use is being gained. This system should be included in plans for reorganization of the transportation system. The Pupil Transportation Section should provide the capability to analyze the record data.

Bus Driver Training

Bus driver training courses are given by area coordinators and by qualified instructors. The extent of training which is given by districts but not under the sponsorship of the Department of Education program is unknown. To date there has been no evaluation of the benefits of the bus driver training course. As the bus driver training program continues, a study should be made to determine differences in citation rates and in causes of accidents for trained and untrained drivers. The study results could be used to strengthen the bus driver training course.

It seems most likely that the course will be found to be beneficial and on the basis of this judgment, the training rate should be increased if possible. The course is now given to about 1,000 drivers each year. The rate at which drivers are lost is unknown, but if it is assumed that 5 percent of the drivers must be replaced each year, it will be nearly 15 years before the present training rate will allow for training of all new drivers.

Routing and Scheduling

The Little Hoover Commission Report showed that the results of 110 routing surveys pointed out opportunities for savings of nearly half a million dollars in annual

operating costs and $1.7 million in capital outlay for bus purchase. Extension of the service to the remaining districts would probably create savings at similar rates.

The Transportation Section is able to make about 50 routing surveys each year. This service would have to be expanded by a factor of 13 in order to survey every district every year. It appears that the greatest need is not for an expansion of the service in its present form but for a newer and faster way of providing the service. A successful computer program would make it economically feasible to provide this service.

Because of the difficulties inherent in preparing a computer program (having the required generality) for such a complex problem, it is not to be expected that a program can be made operational in a short time. The benefits of having a useful program are great enough so that the computer program should be developed. Work on a routing and scheduling program has been started as a part of the Tri-Tran project in Hamilton County. The effort should continue to receive support.

Bus Standards and Specifications

Transportation Section personnel are operating under serious constraints in developing bus standards. Some of the basic steps which would assist in the formulation of improved bus standards are as follows:

(1) Develop a more extensive accident investigation procedure, at least for a limited time period, to provide better information for relating the cause of accidents to bus condition and design characteristics. Such an accident study might be sponsored by the National Highway Safety Bureau.

(2) Develop improved maintenance reporting procedures throughout the State to permit analysis of failures which are potential safety items. The work being performed in the Hamilton County Tri-Tran project establishes the base for such an information system.

(3) Obtain the use of test facilities and develop test procedures to evaluate, under controlled conditions, the compliance of buses with specifications and to develop a meaningful set of specifications.

(4) Develop inspection procedures and inspection reporting procedures to provide information which can be used in evaluating the continuing compliance of bus performance with established standards from manufacture to retirement.

Organizational Alternatives

Two earlier studies of pupil transportation concluded that a reorganization of the system is desirable for achieving significant cost savings and for improving the service provided. Battelle concurs with this conclusion. Four alternative proposals for reorganization of the pupil-transportation system are discussed in this section.

Alternative 1: Little Hoover Commission Transportation Authority

The Commission report proposed the creation of a State Pupil Transit Authority. The Authority would relieve school districts of responsibility for pupil transportation except for routing, scheduling, and student discipline. The Transit Authority would be administered by Area Supervisors who would be under a Director of Transportation, reporting to the State Board of Education.

Alternative 2: Practitioner Panel Administrative Unit

The concept of a Transportation Authority was rejected by the Practitioner Panel chiefly because of the feeling that control of pupil transportation should be kept more at a local level.

As an alternative the Panel proposed that the transportation system should be operated by a number of Area Administrative Units. A unit, which might encompass more than one county, would recruit, train, and supervise operational transportation personnel. It would establish and operate maintenance garages in accordance with State Department standards.

There are three major differences between the proposals of the Commission and the Panel.

(1) The Commission recommended a State Transportation Authority; the Panel proposed elected units perhaps corresponding to the county system.

(2) The Commission organization would be entirely for transportation; the Panel recognized that an Administrative Unit could also have other administrative and service responsibilities.

(3) The Commission did not specify how the costs would be shared; the Panel suggested that the State pay all costs.

Alternative 3: Ohio Department of Education Transportation Regions (Battelle's Recommendation)

The organization of Ohio Department of Education Pupil Transportation Regions is proposed as a structure which can achieve the maximum benefits in safety, maintenance, and large-unit economies while permitting each local district to retain freedom in specifying the level of services which they will provide. The structure is very flexible and can accommodate the entire range of philosophies of pupil transportation from a system very like the present system (as far as costs to local districts are concerned) up to a system where the State pays the entire cost.

Briefly, the State will own all buses and maintain them, and the school districts will obtain the use of the buses from the State pool. The division of responsibilities among the Ohio Department of Education (ODE), the Transportation Regions, and the Attendance Districts are set forth below.

Pupil Transportation Section, Department of Education. Responsibilities of the Transportation Section will include:

(1) Purchase all school buses.

(2) Establish uniform transportation regulations and procedures.

(3) Provide specific guidelines for uniform maintenance procedures.

(4) Establish regulations, policies, and formulas by which school districts may contract for transportation services.

(5) Review, revise, and enforce bus construction standards.

(6) Provide personnel to assist Transportation Regions in conducting the training programs for bus drivers.

(7) Perform analyses for the improvement of maintenance procedures, bus-replacement policy, driver training, and all other aspects of pupil transportation.

Transportation Region. The State will be divided into a number of transportation regions. The regional boundaries will not necessarily coincide with county lines but will be determined by a study of all the factors involved so as to arrive at the design best suited to the transportation needs. Based upon the current number of coordinator districts, 30 might be taken as an estimate of the number of Transportation Regions.

(1) Each Region will be under the direction of an administrator who is well qualified in transportation management. He will be provided with a staff.

(2) Each Region will have responsibility for safety, vehicle maintenance, and driver training in the region.

(3) Regions will keep records and publish reports to conform to regulations set by the Department of Education.

(4) Regions will provide assistance to school districts in routing and scheduling of buses.

Attendance Districts. The pupil attendance districts will:

(1) Recruit bus drivers for their districts

(2) Contract with Transportation Regions for bus usage

(3) Be responsible for discipline of pupils

(4) Provide an administrator who will serve as liaison between the parents and the school district and between the school district and the Transportation Region.

Costs. The Little Hoover Commission estimated that Ohio would need between 60 and 80 central garages for a State-owned maintenance system at a cost of $6 million to $8 million to build and equip if all were new. However, not all garages would have to be new. There are many district-owned garages which could be purchased at a depreciated value. The Commission also pointed out that some of the 88 county garages no longer serve current needs and might be available for school bus garages. For practical reasons the plan will probably be put into effect over a period of years, say three. At this rate the annual cost for garage acquisition will run between $2.0 and $2.7 million per year until enough garages have been acquired. On a basis of straight line depreciation over twenty years, the annual cost for the garages will be between $0.3 and $0.4 million per year. Depending on the number of personnel required and the salary scale, the cost for staffing 30 District offices and 60 to 80 garages might run between $5 and $6 million annually.

As an alternative to the plan of State acquisition and operation of maintenance garages, a plan could be set up in which the regional directors could contract with private or board-owned garages to perform bus maintenance. The garages would be required to meet State standards of inspection, maintenance, and reporting. Although this plan might serve as an interim measure until State-owned garages begin operation in the region, it is felt that this plan would require more supervision, would eliminate the possibility of savings through State-bid purchases of bus supplies, and would create a need for more extensive bookkeeping. The plan is not recommended as a permanent mode of operation.

It is proposed that the separate school districts continue to participate in sharing the transportation costs. Because the State will now own and maintain all buses, the cash flow within the system must necessarily be different. The cash flow in the present system is illustrated in Figure 1, Part A. A local board makes disbursements for bus purchase, operations, and maintenance. The amount of reimbursement is different from board to board. In a system in which the State owns and maintains the buses the cash flow would be different, as shown in Figure 1, Part B. Here the disbursements for bus purchases and operations are made by the State, either directly or through the transportation units. If the State were to bear all transportation costs, there would be no arrow in the diagram relating the local board and the ODE. If, as recommended, each local board would share in the transportation costs, there would be a cash flow from the local board to the ODE. Determination of formulas for regulating this cash flow is in no way limited by the organizational structure. The formulas can be adjusted to fit any policy which is set by the legislature and ODE for any level of State support. The formula should be set so that total cost to the local board of transportation is no higher than the current costs. Local boards would then pay for the use of buses as determined through the formula.

A general formula for regulating the cash flow from the districts is:

Mileage for required transportation	x	Use rate for required transportation	+	Mileage for optional transportation	x	Use rate for optional transportation	=	District payment

With this formula, separate use rates could be set for required and optional transportation if desired. A district's status as an aid district could be reflected through the use rates which are applied to it.

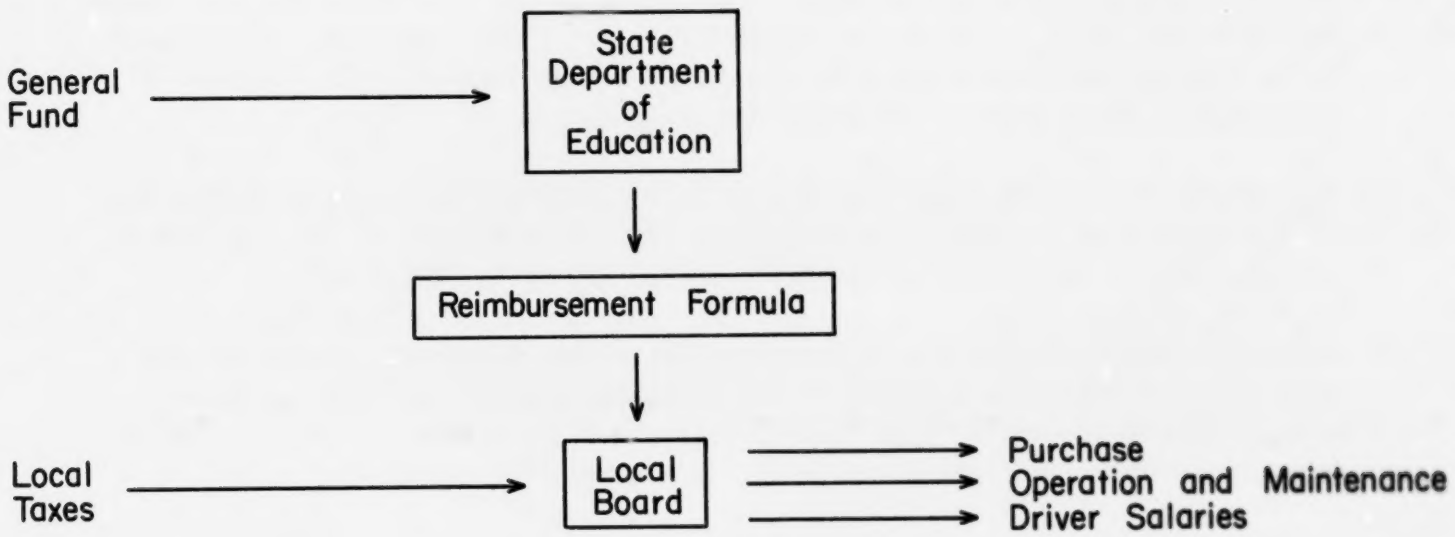

FIGURE 1. CASH FLOW IN THE PUPIL-TRANSPORTATION SYSTEM

Acquisition of Buses. At the present time, the titles to school buses are held by the local school districts. In most cases, the State paid a portion of the original purchase price. There are three ways in which the State could acquire title to the buses.

(1) Appropriate the buses under the same sort of argument which prevents school boards from being sued. That is, the authority of school boards is delegated to them by the State; therefore, they are instruments of the State and cannot be sued without the consent of the State. Following this reasoning, it may be argued that the boards hold title for the State and that the titles may be transferred without recompense. Because local money went directly into the purchase of buses, this method of acquisition is probably not feasible.

(2) Purchase the buses from the districts by paying the depreciated value of the districts' original contribution toward purchase. This method would require too much immediate cash outlay by the State.

(3) Allow a credit on the depreciated value of the district's share of the bus, the credit to be applied to the transportation charges as determined by the formula, and distributed over the expected remaining life of the bus. Figure 2 suggests this method graphically.

Alternative 4: Joint Transportation District

The concept of a Joint Transportation District has been developed by Battelle as a fourth alternative for reorganization. It is suggested only as a partial solution in case the more desirable ODE Transportation Region plan cannot be implemented.

The concept of a Joint Transportation District permits districts to be relieved of the direct problems of bus maintenance while retaining effective local control over the service.

A Joint Transportation District (JTD) is conceived as a group of school districts which have voluntarily united their transportation facilities. It would be a service facility jointly owned and controlled by the member districts. A JTD would receive bids and purchase buses as a unit (perhaps under the State purchase plan), hold title to the buses, provide for bus maintenance, operate them to provide service to the member districts, and receive State reimbursement as a unit. Thus, a JTD would have a position very similar to that which an individual district now has, insofar as transportation is concerned.

Small districts which may find it uneconomical to establish adequate maintenance facilities may, by combining, be able to provide better maintenance, thus providing a safer operation and extending the useful life of the buses. Depending on the geometry of the districts a saving may be achieved by more efficient routing. For large groupings of districts a saving in the number of spare buses needed is likely. Although purchases of fuel and bus supplies may not be in large enough quantities to receive significant discounts, savings might be effected by purchases on bids in districts where retail prices are now paid.

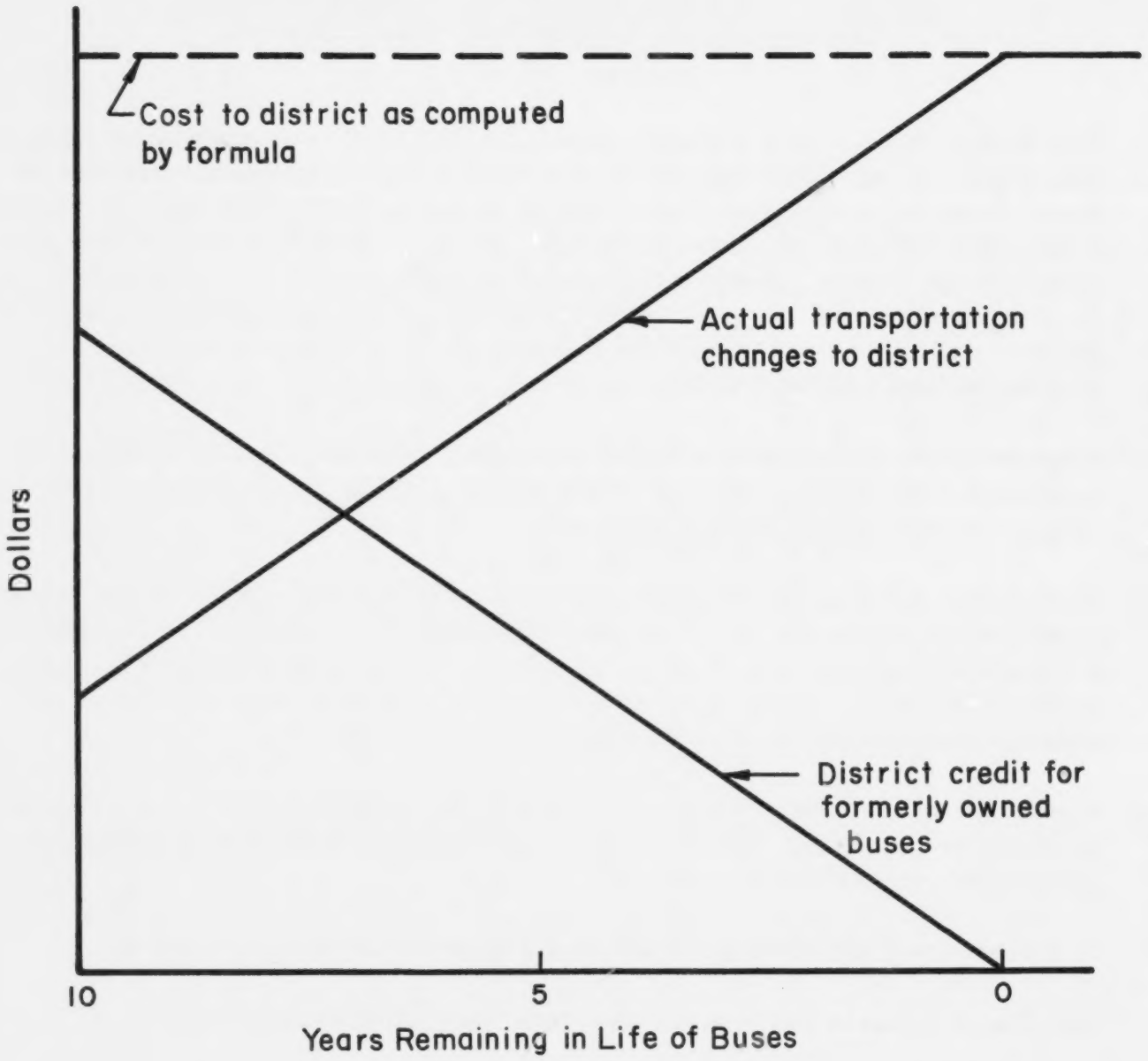

FIGURE 2. EFFECT OF CREDIT FOR FORMERLY OWNED BUSES ON TRANSPORTATION CHANGES

Note: The actual charges to a district are found by subtracting the credit for formerly owned buses from the cost computed by formula.

Although the formation of Joint Transportation Districts may be of value to the local districts involved, it will not achieve the full potential benefits of a more uniform and general system across the State. The result is apt to be a patchwork of many systems still having varying levels of operational efficiency. Battelle does not recommend the JTD plan as the best solution.

Summary of Recommendations for Study of Pupil Transportation for the Ohio School System

(1) The entire pupil transportation system should be reorganized into larger operating units. Although there are several ways in which this can be done, it is recommended that a set of Transportation Regions be organized within the Division of Transportation, ODE. The State should own and maintain all buses. A specific, detailed plan should be prepared for presentation to the Legislature. To do this it will be necessary to perform additional research on the present and future distribution of pupils, school transportation facilities, organization, and finances.

(2) Impediments to the centralized purchasing of school buses must be removed. Implementation of centralized purchasing is the greatest single area of potential economies.

(3) State purchasing of bus supplies should be made possible. Some supplies, gasoline for example, may be available in some areas at lower cost than a State average price. A study should be made to determine the best purchasing plan. Large-order purchasing might create problems of storage and distribution. This should be studied.

(4) Fleet operators (taxis and trucks) state that good maintenance programs prolong vehicle life. More uniform and better maintenance programs are needed for the school bus fleet.

(5) A uniform and detailed maintenance record system is needed to:

   (a) Form a basis for a more realistic bus replacement policy

   (b) Evaluate maintenance standards

   (c) Evaluate bus components.

   The maintenance record system being developed in Project Tri-Tran should be supported.

(6) The bus driver training program should be expanded. At the same time more analysis of the performance of trained versus untrained drivers should be made to evaluate the course content and its general effectiveness.

(7) A computerized routing service should be made available to obtain better usage of buses. A start in this direction has been made in Project Tri-Tran and should be continued.

(8) The development of bus standards should be put on a more systematic basis by:

(a) Identifying any relationships between bus condition and bus design to cause of accidents by a more thorough investigation of accidents

(b) Obtaining the use of test facilities and developing test procedures to evaluate buses and bus components. The proposed test center at Bellefontaine, Ohio, might provide a suitable location.

(9) Bus inspections should be made more frequently by trained personnel to ensure a consistent level of safety throughout the school year. Inspections can be made by ODE Transportation Region personnel if that plan is implemented. Otherwise, a staff of permanent inspectors should be acquired by the Transportation Section to permit ODE to provide regular inspections without adding to the load on the State Highway Patrol. The number of inspectors needed can be determined by identifying the most frequent causes of failure to pass inspections and by defining a procedure for the interim inspections.

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VOCATIONAL AND TECHNICAL EDUCATION—PART I
SUMMARY REPORT—PHASE I

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